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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/479,304	01/06/2000	GEOFFREY B. RHOADS	60085	2884

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EXAMINER	
PICH, PONNOREAY	
ART UNIT	**PAPER NUMBER**
2135	
MAIL DATE	**DELIVERY MODE**
08/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/479,304	RHOADS, GEOFFREY B.	
	Examiner	Art Unit	
	Ponnoreay Pich	2135	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *52-72* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *52-72* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-52 are cancelled. Claims 52-72 were newly added and are pending.

Information Disclosure Statement

The documents listed in the IDS submitted on 11/8/2006 were considered. The examiner has crossed out some documents because they were already cited in either a previously submitted IDS or in an 892 form submitted by the examiner. As such, it is redundant to list them once more.

Response to Arguments

Applicant's arguments that the prior art of record (Reeds and Hopper) do not teach the limitations not claimed were considered. The arguments were not persuasive. Please see further clarification below in the rejection of the claims. As per applicant's argument which was directed towards the motivation to combine, please note that the motivation given below for combining the teachings of Reeds and Hopper came from the prior art themselves. Note that the rationale to modify a prior art invention may be expressly or impliedly contained in the prior art or it may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, because the motivation came from the prior art, the motivation is valid.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 59 and 65 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

1. Claim 59 recites "the plural-bit auxiliary code" which lacks antecedent basis. The examiner will assume applicant meant "a plural-bit auxiliary code".
2. Claim 65 recites "the hidden code" in the last line, which the examiner believes should be "the hidden plural-bit auxiliary code".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 52-54, 58-59, 72, 55-57, and 60-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reeds, III et al (US 5,204,902) in view of Hopper (US 3,406,344).

Claim 52:

Reeds discloses a cell phone including a radio receiver circuitry (Fig 11, item 220), a memory (Fig 11, item 240), a data capture system and a radiant-energy digital data transmission system (Fig 11; col 4, lines 5-9; and col 11, lines 16-27 and 65-66). Note that all cell phones have a data capture system, i.e. microphone for a user to speak into.

Reeds further discloses that the cell phone is characterized in that the cell phone further includes an encoder that alters data captured by the data capture system in accordance with an encoding signal prior to transmission by the data transmission system (col 7, lines 21-34; col 9, lines 28-45; and col 11, lines 21-27). Note that the cited sections discusses that a RAND sequence is broadcasted from a base station to the cell phone. The cell phone uses the RAND sequence as an input into a Jumble process to generate an encoding signal, i.e. bits of group A, which is used to encode/encrypt the user's speech received by the cell phone before transmission.

Reeds further discloses wherein the encoder is adapted to generate an encoding signal that depends, at least in part, on information received by the radio receiver circuitry and stored in the memory (col 7, lines 21-34; col 9, lines 28-45; col 11, lines 21-27 and lines 65-66). The RAND signal was received by the cell phone and stored in block 240. The encoding signal, i.e. bits of group A, is generated at least in part from the RAND signal received by the cell phone. The RAND signal is interpreted to be the claimed information received by the radio receiver circuitry and stored in the memory.

Reeds does not explicitly disclose that the encoder is a steganographic encoder and the encoding is steganographic encoding. However, Hopper discloses use of a

steganographic encoder to perform steganographic encoding in a telephone system (col 1, lines 11-21 and 37-62). Note modulating the auxiliary data signal so that it is found in the speech signal's sideband such that the auxiliary signal is transmitted at the same time as the speech signal without interfering with the speech signal in any perceptible manner is steganographic encoding of the speech signal with the auxiliary signal.

Reeds and Hooper's disclosures are both from the telecommunication field. At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to modify Reeds's invention using Hopper's teachings such that Reeds's cell phone also used steganography to redundantly encoded the user's voice signal by hiding an auxiliary identification signal in the voice signal before transmission. One skilled would have been motivated to do so because Hopper discloses that it is desirable for data service to coexist with speech service for various reasons, i.e. to identify the source of a call (col 1, lines 37-63).

Note that the RAND signal disclosed by Reeds is used for authentication purposes, and as such the RAND signal would have been an obvious choice to create an auxiliary authentication signal from with which to use in steganographic encoding of the voice signal for line/caller identification purposes as per Hopper's teachings. Reeds discloses that to enhance security the cell phone is re-authenticated periodically (col 9, lines 24-25 and 47-50). Using Hopper's teachings to achieve re-authentication is an obvious choice because Hopper discloses that redundantly encoding a signal into the voice data for identification purposes would reduce the error rate in reception (col 4, lines 65-71). Whenever the base station of Reeds's modified invention wanted to re-

authenticate the cell phone, all it has to do is check the authentication data that was steganographically encoded onto the voice data.

Note that the examiner has determined that one of ordinary skill in the art would be an engineer having significant experience in the telecommunication industry and is familiar with different ways of encoding transmitted signals, including using steganography to encode a signal.

Claim 53:

Reeds further discloses that the data capture system captures audio, i.e. speech, and includes a microphone (col 9, lines 28-31). Note that all cell phones includes microphones to capture speech from the user.

Claim 54:

As per claim 54, Hopper further discloses that the steganographic encoder is adapted to operate transparently to a user of the telephone (col 1, lines 37-41 and col 4, lines 44-58), wherein all of the data captured by the data capture system and transmitted by the telephone is steganographically encoded (col 4, lines 44-58 and 67-73).

One skilled should appreciate that when two users speak to each other via a telephone system, any delay due to encoding of the signal for transmission is not noticed by the users, i.e. the encoding is transparent to the user. In the cited portions of Hopper, the auxiliary data signal is transmitted at the same time as the voice signal without any action being taken by the user except for the user to speak as he/she would normally do when using a telephone. Hopper's invention continuously monitors for

speech energy bursts via detector 13 and only when a burst is detected is the auxiliary data signal supplied for modulation with the speech signal. Further, Hopper discusses that it is preferred that the auxiliary code word is repetitively transmitted in the speech signal. This teaching would lead one of ordinary skill to steganographically encode all of the data captured by the data capture system since doing so would provide the maximum redundancy possible. The telephone being a cell phone is obvious over the additional teaching of Reeds.

Claim 58:

Hopper further discloses wherein the steganographic encoder is adapted to combine an overlay signal with the data captured by the data capture system (col 4, lines 44-58 and 67-73 and col 5, lines 3-30).

Note that the cited portions disclose a code word is redundantly transmitted as a sideband of the speech signal. The examiner is considering the signal created by repeating the code word for transmission as the claimed overlay signal. The speech signal is considered the data captured by the data capture system. Since the auxiliary data signal is transmitted simultaneously with the voice signal in the sideband of the voice signal, the overlay/auxiliary data signal is considered combined with voice signal.

Claim 59:

Hopper further discloses wherein the steganographic encoder is adapted to generate an overlay signal, i.e. the signal generated from repeating the code word, that is dependent on both a plural-bit auxiliary code and on the data captured by the data capture system (col 4, lines 44-58 and 67-73; col 5, lines 3-30; and col 6, lines 32-35).

Note that the data signal which is encoded onto to the voice signal is made up of code words. The examiner considers these disclosed code words as plural-bit auxiliary codes. In encoding the (auxiliary) data signal onto the voice signal, the cited section in column 5 discusses that the amplitude of the data signal is adjusted so that it does not cause a noticeable distortion in the speech signal. This adjustment to the data signal is done by measuring the magnitude of the speech burst. As such, the generation of the auxiliary data signal, i.e. the claimed overlay signal, is dependent on both the code words, i.e. plural bit auxiliary code, and on the speech bursts, i.e. the data captured by the data capture system.

Claim 72:

Hopper further discloses wherein the steganographic encoder is adapted to generate an encoding signal that also depends – in part – on dynamics of the data (col 4, lines 44-58 and 67-73; col 5, lines 3-30; and col 6, lines 32-35).

The examiner considers the auxiliary data signal which is encoded as a sideband signal of the speech signal to be the encoding signal. The cited portion of Hopper discusses how the amplitude of the auxiliary data signal is adapted so that it does not cause appreciable distortion in the speech signal. To do this, the magnitudes of individual speech bursts are measured. In other words, the amplitude of the generated encoding signal, i.e. the auxiliary data signal, is dependent at least in part on the dynamics of the data, i.e. speech signal, as measured by the magnitude of each speech burst.

Claim 55:

Reeds discloses:

1. Receiving input information, i.e. user's speech or voice data (col 4, lines 9-12 and col 9, lines 26-44).
2. Receiving data, i.e. RAND and/or RANDU sequence, wirelessly sent from a remote transmitter (col 7, lines 21-34; col 9, lines 28-45; col 11, lines 21-27 and lines 65-66).
3. Encoding the input information, the encoding depending, at least in part on the received data (col 7, lines 21-34; col 9, lines 28-45; col 11, lines 21-27 and lines 65-66). *Note that the RAND signal is used to create a group of bits, i.e. group A, which is used to encode/encrypt speech data. As such the encoding/encryption depends at least in part on the received RAND signal.*
4. Transmitting the encoded information by wireless in a digital format (col 4, lines 9-12; col 9, line 28-44; and col 11, lines 16-35).

Reeds does not explicitly disclose the encoding is steganographically encoding to hide a plural-bit auxiliary code and that the data transmitted is steganographically-encoded information. However, Hopper discloses steganographically encoding a plural-bit auxiliary code, i.e. code words, in received input information, i.e. voice data, and that the information transmitted from the telephone is steganographically-encode information (col 1, lines 11-21 and 37-62).

At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to modify Reeds's invention according to the limitations recited in

claim 55 in light of Hopper's teachings. One skilled would have been motivated to incorporate Hopper's teachings within Reeds's invention for the same reasons discussed in claim 52.

Claim 56:

Reeds further discloses:

1. Receiving the input information in a non-digital form (col 9, lines 28-44 and col 11, lines 21-27). *One skilled should appreciate that human speech is analog in nature. As such when the cell phone's microphone is used to receive the speech into the cell phone, the speech is received in analog format. Further evidence of this is that the information has to be converted into digital format. This means that the information was not in digital format when received.*
2. Expressing the received information in digital format (col 9, lines 28-44 and col 11, lines 21-27).
3. Encoding the digital form of the input information (col 9, lines 28-44).

Claim 57:

Reeds further discloses wherein the input information is audio information, i.e. speech (col 9, lines 28-44).

Claim 60:

Hopper further discloses wherein the steganographic encoding includes combining an overlay signal with the input information (col 4, lines 44-58 and 67-73 and col 5, lines 3-30).

Note that the cited portions disclose a code word is redundantly transmitted as a sideband of the speech signal. The examiner is considering the signal created by repeating the code word for transmission as the claimed overlay signal. The speech signal is considered the data captured by the data capture system. Since the auxiliary data signal is transmitted simultaneously with the voice signal in the sideband of the voice signal, the overlay/auxiliary data signal is considered combined with voice signal, i.e. input information.

Claim 61:

Hopper further discloses wherein the steganographic encoding includes combining an overlay signal with the input information (col 4, lines 44-58 and 67-73; col 5, lines 3-30; and col 6, lines 32-35).

Note that the cited portions disclose a code word is redundantly transmitted as a sideband of the speech signal. The examiner is considering the signal created by repeating the code word for transmission as the claimed overlay signal. The speech signal is considered the data captured by the data capture system. Since the auxiliary data signal is transmitted simultaneously with the voice signal in the sideband of the voice signal, the overlay/auxiliary data signal is considered combined with voice signal, i.e. input information.

Claim 62:

The limitations recited in claim 62 can all also be found in claims 52, 55, and 72 and as such, claim 62 is rejected over Reeds and Hopper for similar reasons discussed in claims 52, 55, and 72.

Claim 63:

Hopper further discloses the steganographic encoder is adapted to control an amplitude of the encoding signal, i.e. the auxiliary data signal, in part, in accordance with dynamics of the data, i.e. the speech signals (col 5, lines 3-30).

The examiner considers the auxiliary data signal which is encoded as a sideband signal of the speech signal to be the encoding signal. The cited portion of Hopper discusses how the amplitude of the auxiliary data signal is adapted/controlled so that it does not cause appreciable distortion in the speech signal. To do this, the magnitudes of individual speech bursts are measured. In other words, the amplitude of the generated encoding signal, i.e. the auxiliary data signal, is dependent at least in part on the dynamics of the data, i.e. speech signal, as measured by the magnitude of each speech burst.

Claim 64:

The limitations further recited in claim 64 are substantially similar to limitations found recited in claim 52 and as such claim 64 is rejected for similar reasons discussed in claim 52.

Claim 65:

Most of the limitations recited in claim 65 are also found in claims 52 and 55 and these limitations are rejected for similar reasons discussed in claims 52 and 55. Claim 65 additionally recites "the steganographic encoder being adapted to introduce a pseudo-random signal to the data in which the hidden plural-bit auxiliary code is encoded". This limitation reads on encrypting the steganographically encoded data

signal using a randomly generated key. Official notice is taken that encrypting signals with a random key was well known in the art. At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to further modify Reeds's invention such that the steganographic encoder was encrypted by introducing a pseudo-random signal to the data after the data signal was encoded by hiding the plural-bit auxiliary code within the data signal. One skilled would have been motivated to do so because it would ensure private communication on the cell phone. One skilled would have been motivated to use a pseudo-random signal as the encryption key because they offer a high level of security. Note that in just relying on steganography alone, an eavesdropper can still listen in on a cell phone call electronically. Note that Reeds was interested in encryption of the speech data (col 9, lines 24-25).

Claims 66-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reeds, III et al (US 5,204,902) in view of Hopper (US 3,406,344) and further in view of Lee et al (US 5,687,191) and as evidenced by Jones (3,586,781).

Claim 66:

Most of the limitations recited in claim 66 are also found in claims 52 and 55 and these limitations are rejected for similar reasons discussed in claims 52 and 55. Claim 66 additionally recites "the host data comprising sample values, and the steganographic encoder being adapted to increase certain of the sample values and decrease others."

Hopper discloses the host data, i.e. voice data, comprising sample values, i.e. speech bursts (col 4, lines 44-49 and col 5, lines 3-30).

Reeds and Hopper do not explicitly disclose the steganographic encoder being adapted to increase certain of the sample values and decrease others. However, the limitation is disclosed by Lee (col 7, lines 34-44). The cited portion of Lee discusses that each samples' amplitude are analyzed and normalized. Normalization of the amplitude implies that the amplitude of samples that were above the mean value were decreased, while the amplitude of samples that were below the mean value were increased.

At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to further modify Reeds' invention according to the limitations recited in claim 66 in light of Lee's teachings. One skilled would have been motivated to do so because as evidenced by Jones, speech signals typically vary over a dynamic range, some being very loud, i.e. having high amplitude, while others are very soft, i.e. having low amplitude, and modulating the amplitude of the speech samples so that they were more uniform, i.e. normalized, would improve the quality of transmissions (Jones: col 1, lines 28-36 and 65-69).

Claim 67:

Reeds, Hoper, and Lee do not explicitly disclose wherein the steganographic encoder is adapted to increase certain of the sample values between 7.5% and 100%. However, as discussed in claim 66, as per Lee's teachings, it would improve transmission if the amplitude of the host data, i.e. voice samples, were normalized. This

would mean that the amplitude of some of the samples would be increase, while some were decreased. It would not be unexpected that in normalizing some of the samples having low amplitude that the amplitudes may increase anywhere from 7.5% and 100%. It would not be unreasonable to assume that one of ordinary skill would try different percentages of increasing the amplitude of the lower amplitude samples and in routine experimentation find that some of the samples should be increased anywhere from 7.5% to 100% to achieve better quality of transmission.

Claim 68:

The limitations further recited in claim 68 are similar to what is recited in claim 72 and are rejected for similar reasons. Note that the encoding referred to in claim 72 is steganographic encoding to hide the plural-bit auxiliary code as recited in claim 68.

Claim 69:

Claim 69 recites limitations similar to those found in claims 55 and 66 and as such claim 69 is rejected over Reeds, Hooper, Lee, and as evidenced by Jones for the reasons discussed in claims 55 and 66.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ponnoreay Pich whose telephone number is 571-272-7962. The examiner can normally be reached on 9:00am-4:30pm Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Vu can be reached on 571-272-3859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ponnoreay Pich
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